

Setup Guide

IMPORTANT:
Refer to www.extron.com for the complete user manual and installation instructions before connecting the product to the power source.



CrossPoint 450 Plus Series MAV Plus Series Large Scale Matrix Switchers

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Precautions

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conservier les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

Warning

- Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.
- Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.
- Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

- Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.
- Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.
- Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas éraclés ou pincés par des objets.
- Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.
- Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.
- Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

- Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluss, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.
- Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.
- Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.
- Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.
- Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.
- Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

- Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.
- Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.
- Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.
- Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario debe acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.
- Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.
- Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron USA
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Europe, Africa, and the Middle East:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

Asia:

Extron Asia
135 Joo Seng Road #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Japan:

Extron Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

China:

Extron China
686 Ronghua Road, Songjiang
District
Shanghai 201611
China

Middle East:

Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE

This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

Table of Contents

Chapter One • Introduction	1-1
About this Manual	1-2
About the Matrix Switchers.....	1-2
Chapter Two • Installation	2-1
Rear Panel Installation Features	2-3
Video and audio connections, sync termination, and external sync	2-3
Remote control connections	2-4
BME connection and selection	2-5
Power connection	2-6
Front Panel Configuration Port.....	2-6
Chapter Three • Front Panel Operation.....	3-1
Creating a Tie.....	3-2
Saving or Recalling a Preset.....	3-3
Setting the Front Panel Locks (Executive Modes).....	3-4
Selecting Lock mode 2 or toggling between mode 2 and mode 0	3-4
Selecting Lock mode 2 or toggling between mode 2 and mode 1	3-5
Viewing and Adjusting the Input Audio Level and Output Volume.....	3-5
Viewing Ties (and Muting Outputs).....	3-6
Chapter Four • Remote Control	4-1
Selected SIS Commands.....	4-2
Establishing a network (Ethernet) connection	4-2
Connection timeouts	4-2
Number of connections.....	4-3
Verbose mode.....	4-3
Installing and Starting the Control Program.....	4-10
Installing the program.....	4-10
Starting the program.....	4-11
Accessing the HTML Pages	4-13
Configuring for Network Communication	4-13
Loading the start-up page.....	4-15

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1

Chapter One

Introduction

About this Manual

About the Matrix Switchers

Introduction

NOTE For more information on any subject in this guide, refer to the CrossPoint 450 Plus / MAV Plus User's Manual, available on the Extron DVD or at www.extron.com.

About this Manual

This setup guide allows you to easily and quickly set up and configure your matrix switcher system. This manual also shows you how to:

- Perform basic operations and use both the front panel controls and selected Simple Instruction Set (SIS™) commands
- Load and start up the Windows®-based Matrix Switchers Control Program
- Connect to the built-in HTML pages, which you can use to operate the switcher.

About the Matrix Switchers

The Extron matrix switcher systems covered in this manual distribute any input to any combination of outputs, routing multiple input/output combinations simultaneously.

The matrix switchers covered in this manual are a family of matrix switcher basic module enclosures (BMEs) that let you create very large (up to 64 inputs and 64 outputs) matrix switching systems for video, audio, or both. This family of matrix switcher BMEs includes the following models:

- **CrossPoint 450 Plus Wideband video** — Routes a single video plane (red [R], green [G], or blue [B]).
- **CrossPoint 450 Plus Sync** — Routes a single sync plane (horizontal [H], vertical [V], or composite sync [S]).
- **MAV Plus Video** — Routes a single plane of low resolution (NTSC/PAL/SECAM) component video (Y, R-Y, or B-Y), S-video (Y or C), and composite video.
- **MAV Plus Stereo Audio** — Routes balanced or unbalanced stereo audio (two audio planes).
- **MAV Plus Mono Audio** — Routes mono audio (one audio plane).

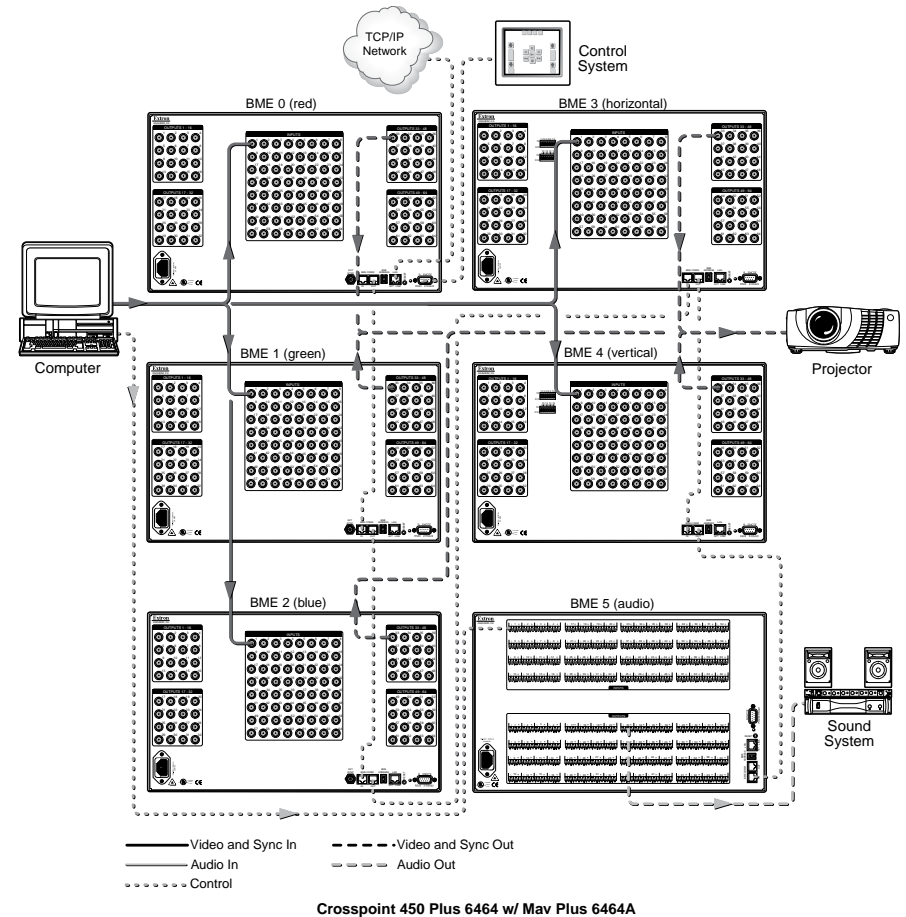


Figure 1-1 — Typical matrix switcher application



2

Chapter Two

Installation

Rear Panel Installation Features

Front Panel Configuration Port

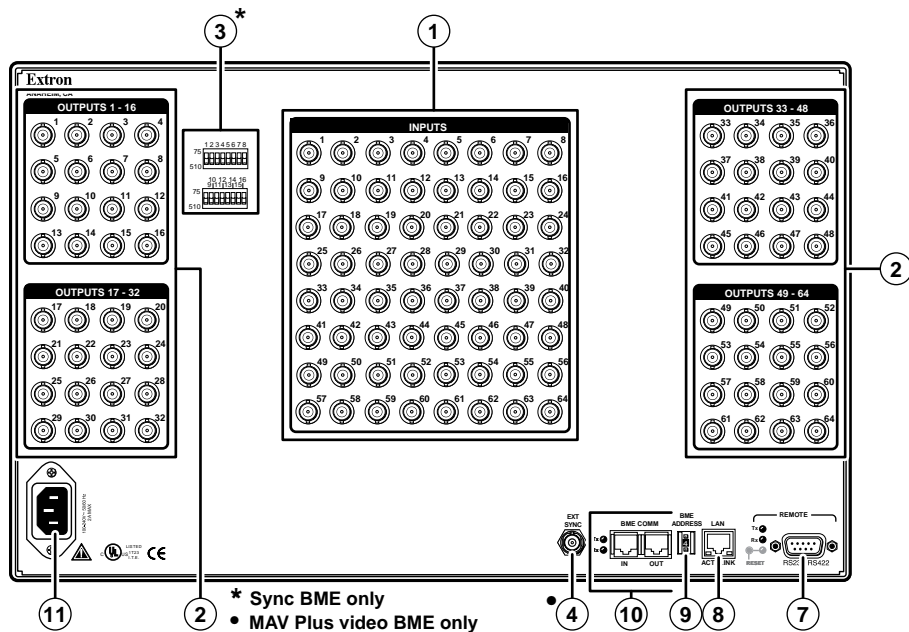


Figure 2-1 — Sync or video BME

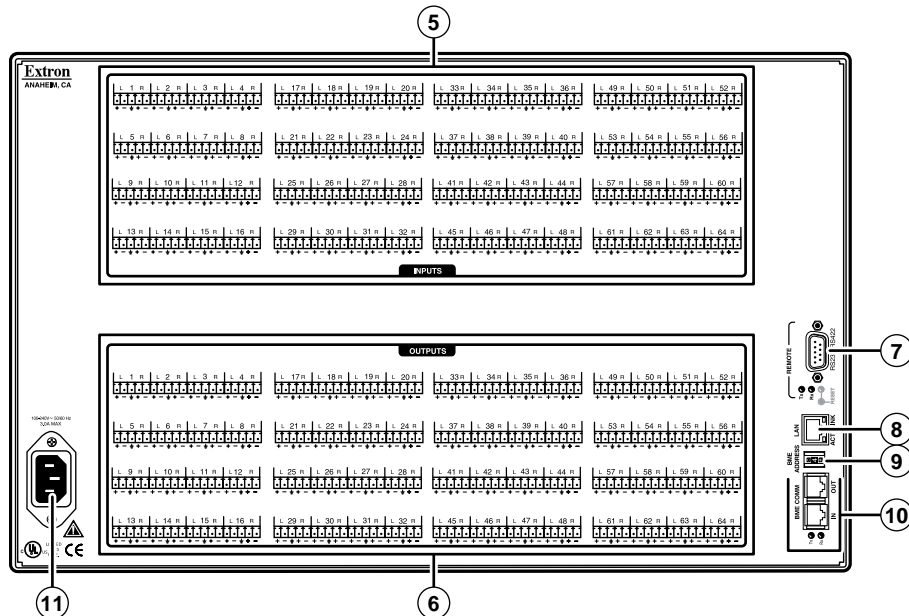


Figure 2-2 — Audio BME

NOTE Extron recommends locking redundant front panel controllers (if included in your system). See page 3-4.

Rear Panel Installation Features

NOTE Only sync BMEs have sync termination switches.
Only MAV Plus video BMEs have External Sync connectors.

NOTE Smaller matrix sizes have fewer input connectors, output connectors, or both.

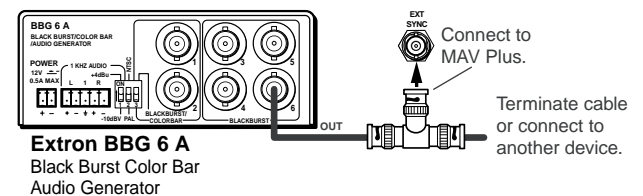
Video and audio connections, sync termination, and external sync

CAUTION Turn off power to the input and output devices, and disconnect their power cords.

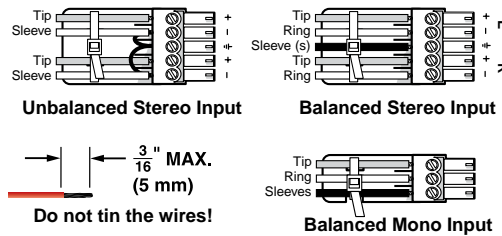
- ① **Video inputs** — Connect RGBHV, RGBS, RGsB, RsGsBs, component/ HDTV video, S-video, or composite video sources, as appropriate to your switcher system's video format and matrix size.
- ② **Video outputs** — Connect RGBHV, RGBS, RGsB, RsGsBs, component/HDTV video, S-video, or composite video displays, as appropriate to your switcher system's video format and matrix size.
- ③ **Sync termination switches (sync BMEs only)** — Set the switches as necessary to condition non-TTL sync levels greater than 5 Vp-p for inputs 1 through 16 only. Sync termination enables the sync to be properly passed from an input to the selected output(s).

510 ohms — The default position, suitable for most video.

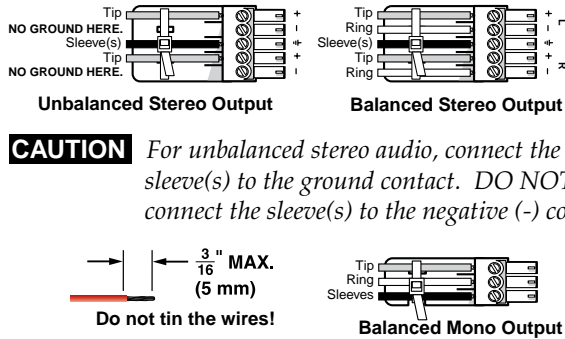
75 ohms — Typically required only for an input with non-TTL sync (greater than 5 V p-p).
- NOTE** An input that produces an out of sync display, a display that is rolling vertically and/or tearing horizontally, could indicate a non-TTL sync input. If you are not sure, check the specifications in the user's manual for the input device.
- ④ **External Sync (MAV Plus video BME)** — If desired, attach an external sync timing device to the external sync connector.



- ⑤ **Audio inputs (audio BMEs)** — Connect stereo or mono audio sources to the 5-pole or 3-pole captive screw connectors.



- ⑥ **Audio outputs (audio BMEs)** — Connect stereo or mono audio devices to the 5-pole or 3-pole captive screw connectors.



Remote control connections

- ⑦ **Remote port** — If desired, connect a control system or computer to the rear panel Remote RS-232/RS-422 port.

NOTE Remote port defaults: RS-232, 9600 baud, no parity, 8-bit, 1 stop bit, no flow control.

Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit	TX-	Transmit (-)
3	RX	Receive	RX-	Receive (-)
4	—	Not used	—	Not used
5	Gnd	Ground	Gnd	Ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive (+)
8	—	Not used	TX+	Transmit (+)
9	—	Not used	—	Not used

- ⑧ **LAN port** — If desired, connect a network WAN or LAN hub, a control system, or computer to the Ethernet RJ-45 port.

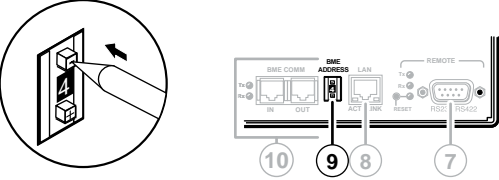
- **Network connection** — Wire as a patch (straight) cable.
- **Computer or control system connection** — Wire the interface cable as a crossover cable.

NOTE The factory default IP address is 192.168.254.254.

BME connection and selection

NOTE BME 0 should house the front panel controller (if included in your system) and be the BME used for system control and monitoring via the serial and Ethernet LAN ports.

- ⑨ **BME address switch** — Each BME must be set to a unique address of 0 through 5 (addresses 6 through 9 are invalid).

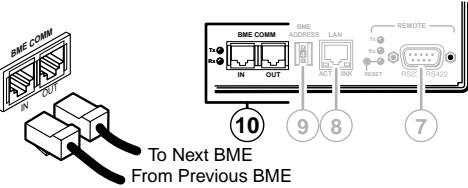


Sync BMEs cannot be set to address 0.

The addresses used in the system must be sequential with no skipped numbers.

- ⑩ **BME COMM interconnect ports** — The BMEs in multiple BME systems must be daisy-chained.

Connect an RJ-45 cable from BME 0's BME Comm Out connector to the nearest BME's BME Comm In connector (usually BME 1).



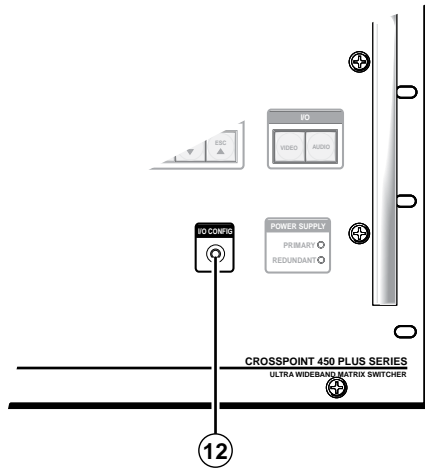
Connect the next RJ-45 cable from BME 1's BME Comm Out connector to the nearest unconnected BME's BME Comm In connector (usually BME 2).

Continue connecting RJ-45 cables from each daisy-chained module's BME Comm Out connector to the next module's BME Comm In connector until all modules are included in the chain.

Power connection

- ⑪ **Power** — Plug the switcher into a grounded AC source.

Front Panel Configuration Port



- ⑫ **Configuration port** — If desired, connect a control system or computer to the front panel Configuration (RS-232) port. Use an optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01.



Chapter Three

Front Panel Operation

Creating a Tie

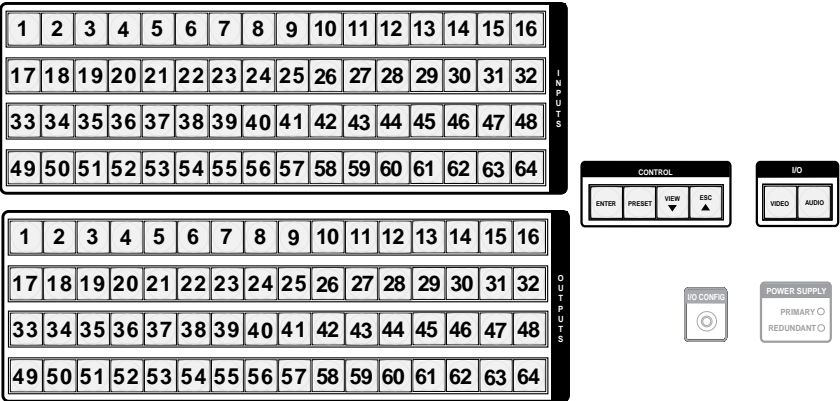
Saving or Recalling a Preset

Setting the Front Panel Locks (Executive Modes)

Viewing and Adjusting the Input Audio Level and Output Volume

Viewing Ties (and Muting Outputs)

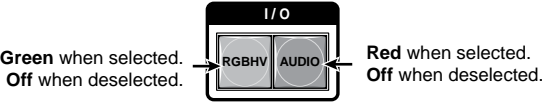
Front Panel Operation



NOTE The video selection button is labeled “RGBHV” on the CrossPoint 450 Plus switcher BMEs and “Video” on the MAV Plus switcher BMEs.

Creating a Tie

- 1. Press and release the Esc button to clear any button indicators that may be lit.
- 2. Press and release the RGBHV/Video and/or Audio I/O button(s) to select or deselect video and/or audio as desired.

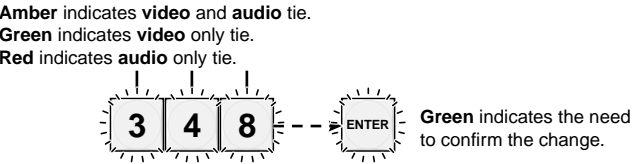


NOTE Audio or video can be broken away (tied by itself) by selecting *only* the RGBHV/video button or *only* the Audio button.

- 3. Press and release the desired input button.
The button lights to indicate the selection.



- 4. Press and release the desired output button(s).

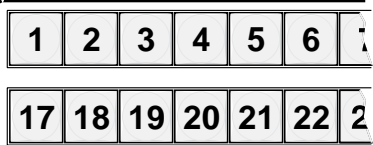
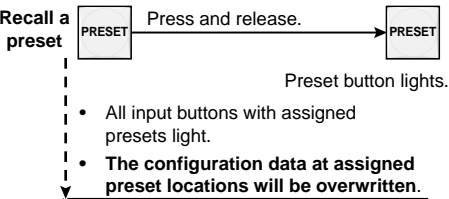
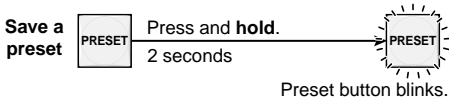


- 5. Press and release the Enter button. All button indicators turn off.

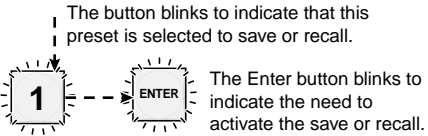
Saving or Recalling a Preset

- 1. Save a preset — Press and hold the Preset button until it flashes.

Recall a preset — Press and release the Preset button.



- 2. Press and release the desired input button.



- 3. Press and release the Enter button.

Setting the Front Panel Locks (Executive Modes)

The matrix switcher has three levels of front panel security lock that limit the operation of the switcher from the front panel. The three levels are:

- **Lock mode 0** — The front panel is completely unlocked.
- **Lock mode 1** — All changes are locked from the front panel (except for setting Lock mode 2). Some functions can be viewed.
- **Lock mode 2** — Basic functions are unlocked. Advanced features are locked and can be viewed only.

Basic features consist of:

- Making ties
- Saving and recalling presets
- Setting input audio gain and attenuation
- Changing Lock modes

Advanced features consist of:

- Setting video and audio output mutes
- Setting audio output volume

NOTE The switcher is shipped from the factory in Lock mode 2.

NOTE For a complete list of advanced features, refer to the CrossPoint 450 Plus / MAV Plus User's Manual, available on the Extron DVD or at www.extron.com.

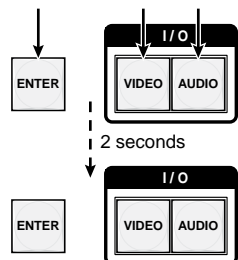
Selecting Lock mode 2 or toggling between mode 2 and mode 0

NOTE If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2.

If the switcher is in Lock mode 2, this procedure selects mode 0 (unlocks the switcher).

Toggle the lock on and off by pressing and holding the Enter button, the Video button, and the Audio button for approximately 2 seconds.

Press and **hold** simultaneously.



The buttons blink twice.
Release the buttons.

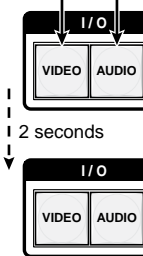
Selecting Lock mode 2 or toggling between mode 2 and mode 1

NOTE If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2.

If the switcher is in Lock mode 2, this procedure selects mode 1.

Toggle the lock on and off by pressing and holding the Video button and the Audio button for approximately 2 seconds.

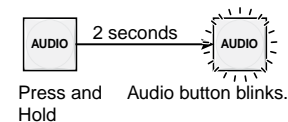
Press and **hold** simultaneously.



The buttons blink twice.
Release the buttons.

Viewing and Adjusting the Input Audio Level and Output Volume

1. Press and **hold** the Audio button until it flashes.



2. Press an input button (for input level) or output button (for volume). Refer to the CrossPoint 450 Plus / MAV Plus Switcher User's Manual, chapter 3, "Operation", to read the displayed value.
3. Increase/decrease the level or volume by pressing the Esc (▲) and View (▼) buttons.
4. Press and release the Audio button to exit.

Viewing Ties (and Muting Outputs)

1. Press the View button. Output buttons light for outputs that have no ties established.
- NOTE** *If an output button blinks, that output is muted.*
2. Press an input button. The buttons for all tied outputs light (amber for video and audio, green for video only, and red for audio only).
3. Press an output button. The buttons for the tied input and all tied outputs light.
4. **If you want to toggle a mute on and off**, press and hold the output button for 2 seconds.
5. Press the View button. All input and output buttons return to an unlit state.



Chapter Four

Remote Control

Selected SIS Commands

Installing and Starting the Control Program

Accessing the HTML Pages

Selected SIS Commands

The switchers have Simple Instruction Set (SIS™) commands that you can use for operation and configuration. You can run these commands from a PC connected to either of the switcher's serial ports or the Ethernet port. See ⑦ (page 2-4), ⑧ (page 2-5), and ⑩ (page 2-6), for connection information.

Establishing a network (Ethernet) connection

NOTE *If you connect to the switcher via the LAN port, and it is the first time you have done so, you may change the controller's default settings (IP address, subnet mask, and [optional] administrator name and password). See "Configuring for Network Communication" for details.*

Establish a network connection as follows:

1. Open a TCP socket to port 23 using the switcher's IP address.

NOTE *The factory default IP address is 192.168.254.254.*

The switcher responds with a copyright message including the date, the name of the product, the firmware version, the part number, and the current date/time.

NOTE *If the switcher is not password-protected, the device is now ready to accept SIS commands.*

NOTE *If the switcher is password-protected, a password prompt appears.*

2. If the switcher is password protected, enter the appropriate password.

If the password is accepted, the switcher responds with *Login User* or *Login Administrator*.

If the password is not accepted, the *Password* prompt reappears.

Connection timeouts

The Ethernet link times out and disconnects after a designated period of time of no communications. By default, this timeout value is set to five minutes but the value can be changed. See the Set Connection Timeout command on page 4-9.

NOTE *Extron recommends leaving the default timeout at five minutes and periodically issuing the Query (Q) command to keep the connection active or disconnecting the socket and reopening the connection when necessary.*


Number of connections

A switcher can have up to 200 simultaneous TCP connections, including all HTTP sockets and Telnet connections. When the connection limit is reached, the switcher accepts no new connections until some have been closed. No error message or indication is given that the connection limit has been reached. To maximize performance of your switcher, the number of connections should stay low and unnecessary open sockets should be closed.

Verbose mode

Telnet connections to a switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other Telnet sockets or a serial port. For a Telnet session to receive change notices from the switcher, the Telnet session must be in verbose mode 3. See the Verbose Mode command on page 4-9. In verbose mode 3, the Telnet socket reports changes in messages that resemble SIS command responses.

Host-to-switcher instructions

The switcher accepts SIS (Simple Instruction Set) commands through either serial port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ) , which signals the end of the response character string. A string is one or more characters.

NOTE *The table that begins on the next page is a partial list of SIS commands. For a complete listing, refer to the CrossPoint 450 Plus / MAV Plus Switcher User's Manual, chapter 4, "Programmer's Guide".*

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
NOTE	<ul style="list-style-type: none"> Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02&003*003%4*24\$. The matrix switchers support 1-, 2-, and 3-digit numeric entries (1*1!, 02*02&, or 003*003%). 		
NOTE	When you create a tie where X1 = 00, you tie no input to the specified output (X2) (untie X2). When you create a tie where X2 = 00, you untie all outputs from input X1 .		
NOTE	The & tie command for RGB and the % tie command for video can be used interchangeably.		
NOTE	The & read tie command for RGB and the % read tie command for video can be used interchangeably.		
Tie input X1 to output X2 , video and audio	X1 * X2 !	Out X2 •In X1 •All←	Tie input X1 's video and audio to output X2 .
Example:	1*3!	Out03•In01•All←	Tie input 1 video and audio to output 3.
Tie input X1 to output X2 , RGBHV	X1 * X2 &	Out X2 •In X1 •RGB←	Tie RGB only (video breakaway).
Example (see 3rd Note, above):	10*4&	Out04•In10•RGB←	Tie input 10 RGB to output 4.
Tie input X1 to output X2 , video	X1 * X2 %	Out X2 •In X1 •Vid←	Tie video only (video breakaway).
Example (see 3rd Note, above)	7*5%	Out05•In07•Vid←	Tie input 7 video to output 5.
Tie input X1 to output X2 , audio	X1 * X2 \$	Out X2 •In X1 •Aud←	Tie audio only (audio breakaway).
Example:	24*04\$	Out04•In24•Aud←	Tie input 24 audio to output 4.
Read RGB output tie	X2 &	X1 ←	RGBHV input X1 is tied to output X2 .
Read video output tie	X2 %	X1 ←	Video input X1 is tied to output X2 .
Read audio output tie	X2 \$	X1 ←	Audio input X1 is tied to output X2 .

NOTE X_1 = Input number 00 – (maximum number of inputs for your model) (00 = untie)
 X_2 = Output number 00 – (maximum number of outputs for your model) (00 = untie all outputs)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Video and audio mute commands			
RGB/video mute	[X2]*1B	Vmt[X2]*1 ←	Mute output [X2] RGB (video off).
RGB/video unmute	[X2]*0B	Vmt[X2]*0 ←	Unmute output [X2] RGB (video on).
Read RGB/video mute	[X2]B	[X3] ←	1 = mute on, 0 = mute off.
Global RGB/video mute	1*B	Vmt1 ←	Mute all RGB outputs.
Global RGB/video unmute	0*B	Vmt0 ←	Unmute all RGB outputs.
Audio mute	[X2]*1Z	Amt[X2]*1 ←	Mute output [X2] audio (audio off).
Audio unmute	[X2]*0Z	Amt[X2]*0 ←	Unmute output [X2] audio (audio on).
Read audio mute	[X2]Z	[X3] ←	1 = mute on, 0 = mute off.
Global audio mute	1*Z	Amt1 ←	Mute all audio outputs.
Global audio unmute	0*Z	Amt0 ←	Unmute all audio outputs.
View output mutes	[Esc]VM ←	[X4] ¹ , [X4] ² , ... [X4] ⁿ ←	Each [X4] response is the mute status of an output, starting from output 1. n = the maximum number of outputs for this model.
Example: CrossPoint 450 Plus 6432 HVA	[Esc]VM ←	Mut02202000000000000000000000000000 ←	Output 2, 3, and 5 audio is muted. All other outputs are unmuted.
NOTE The “Mut” portion of the response appears only when the switcher is in Verbose mode 3. See the Verbose mode command on page 4-*			

NOTE	X2 = Output number	01 – (maximum number of outputs for your model)
	X3 = Mute	0 = off (unmuted)
		1 = on (muted)
	X4 = Video/audio mute:	0 = no mutes
		1 = video mute
		2 = audio mute

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio output volume			
Set the audio volume to a specific value <i>Example:</i>	X2 * X5 V 1*50v	Out X2 •Vol X5 ↵ Out01•Vol50↵	Set output 1 volume to an X5 value of 50, an attenuation of 14 dB (79% of total volume).
Increment volume <i>Example:</i>	X2 +V 1+V	Out X2 •Vol X5 ↵ Out01•Vol51↵	Increase volume by 1 step.
Decrement volume	X2 -V	Out X2 •Vol X5 ↵	Decrease volume by 1 step.
Read output volume	X2 V	X5 ↵	
Save and recall presets			
NOTE <ul style="list-style-type: none"> If you try to recall a preset that is not saved, the matrix switcher responds with the error code E11. The following characters are invalid in preset names: +, -, ` @ = [] { } ' " ; : \ and ?. 			
Save current configuration as a global preset <i>Example:</i>	X6 , 9,	Spr X6 ↵ Spr09↵	Command character is a comma. Save current ties as preset 9.
Recall a global preset <i>Example:</i>	X6 . 5.	Rpr X6 ↵ Rpr05↵	Command character is a period. Recall preset 5, which becomes the current configuration.

NOTE **X2** = Output number
X5 = Volume
X6 = Preset number

01 – (maximum number of outputs for your model)
0 – 64 (1 dB/step except for 0-to-1, which is 22 dB) (default = 64 [0 dB])
00 – 64 (00 = current configuration, for viewing only)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Lock (executive) modes			
NOTE See “Setting the front panel locks (Executive modes)” on page 3-4 for more information on the Lock modes.			
Lock all front panel functions	1X	Exe1↵	Enable Lock mode 1.
Lock advanced front panel functions	2X	Exe2↵	Enable Lock mode 2.
Unlock all front panel functions	0X	Exe0↵	Enable Lock mode 0.
View lock status	X	X7 ↵	

NOTE **X7** = Lock mode 0, 1, or 2

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Information requests			
Information request	I	V[X8]X[X9]•A[X8]X[X9]T[X12]U[X13]↵	V[X8]X[X9] = video size, A[X8]X[X9] = audio size, T[X12] = BME type, U[X13] = # of BMEs in system. This low resolution matrix switcher (T2) has 64 video and 64 audio inputs by 48 video and 48 audio inputs. This is a two BME system (a video and audio BME).
Example: MAV 450 Plus 6448 with a connected audio BME	I	V64X48•A64X48•T2•U2↵	
Request part number	N	[X10]↵	
Query controller firmware version	Q	[X11]↵	The factory-installed controller firmware version is 1.23 (sample value only).
Example:	Q	1.23↵	

NOTE

[X8] = Inputs

Total number of inputs for this switcher

[X9] = Outputs

Total number of outputs for this switcher

[X10] = Part number

See the *CrossPoint 450 Plus / MAV Plus User's Manual*, for a complete list of part numbers.

[X11] = Firmware version number to second decimal place (x.xx)

[X12] = BME type

1 = wideband video

3 = sync

5 = mono audio

2 = low resolution video

4 = stereo audio

[X13] = # of connected BMEs

1 through 6

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
IP setup			
Set matrix name	[Esc][X14]CN↵	Ipn•[X14]↵	
Read matrix name	[Esc]CN↵	[X14]↵	
Reset matrix name to factory default	[Esc]•CN↵	Ipn•[X14]↵	Model name plus the last 3 pairs of the MAC address.
Set IP address	[Esc][X15]CI↵	Ipi[X15]↵	
Read IP address	[Esc]CI↵	[X15]↵	
Set subnet mask	[Esc][X15]CS↵	Ips[X15]↵	
Read subnet mask	[Esc]CS↵	[X15]↵	
Set gateway IP address	[Esc][X15]CG↵	Ipg[X15]↵	
Read gateway IP address	[Esc]CG↵	[X15]↵	
Set DHCP on or off	[Esc][X16]DH↵	Idh[X16]↵	
Read DHCP on/off status	[Esc]DH↵	[X16]↵	
Set verbose mode	[Esc][X17]CV↵	Vrb[X17]↵	
Read verbose mode	[Esc]CV↵	[X17]↵	
Configure current port timeout	[Esc]0*[X18]TC↵	Pti0*[X18]↵	
Read current port timeout	[Esc]0TC↵	[X18]↵	
Configure global IP port timeout	[Esc]1*[X18]TC↵	Pti1*[X18]↵	
Read global IP port timeout	[Esc]1TC↵	[X18]↵	

NOTE

[X14] = Name

(Up to 240 alphanumeric characters)

[X15] = IP address

###.###.###.###

[X16] = DHCP

0 = off 1 = on

[X17] = Verbose mode

0 = clear/none (default for Telnet connection) 2 = tagged responses for queries

1 = verbose mode (RS-232/RS-422 default) 3 = verbose mode and tagged for queries

[X18] = Port timeout

1 (= 10 seconds) - 65000 (default is 30 = 300 seconds = 5 minutes)

Installing and Starting the Control Program

Another way to operate the switcher is via the Windows®-based Matrix Switchers Control Program. This program is contained on the Extron Software Products DVD (included with the switcher). Run this program on a PC connected to either of the switcher's serial ports or the Ethernet port. See ⑦ (page 2-4), ⑧ (page 2-5), and ⑨ (page 2-6), for connection information. The program must be installed on a Windows-based computer and cannot be run from the DVD.

NOTE For details on operating the program, refer to the CrossPoint 450 Plus / MAV Plus Switcher User's Manual, chapter 5, "Matrix Software".

NOTE If you connect to the switcher via the LAN port, and it is the first time you have done so, you may need to change the controller's default settings (IP address, subnet mask, and [optional] administrator name and password). See "Configuring for Network Communication" for details.

Installing the program

- 1. Insert the disk into the drive. The installation program should start automatically.
- The Extron software DVD window appears.



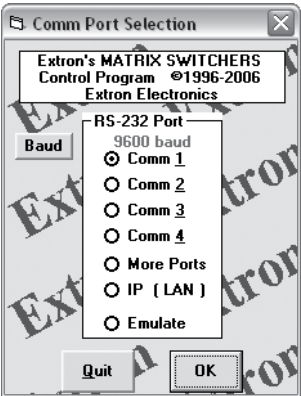
NOTE If the installation program does not self-start, run Launch.exe from the DVD.

- 2. Click the **Software** tab.
 - 3. Scroll to the Matrix Switchers program and click **Install**.
- **Matrix Switchers**
RS-232 Windows
Control Program.

- 4. Follow the on-screen instructions. The installation program creates a C:\Program Files\Extron\Matrix_Switchers directory and an "Extron Electronics\Matrix Switchers" group folder. It installs the following four programs:
- MATRIX Switcher+ Control Program
 - MATRIX Switcher+ Help
 - Uninstall MATRIX Switcher
 - Check for Matrix Updates

Starting the program

- 1. Click **Start > Programs > Extron Electronics > Matrix Switchers > MATRIX Switcher + Control Pgm.**
- The Comm Port Selection window appears.



- 2. Choose the comm (serial) port that is connected to the switcher or **IP [LAN]**.

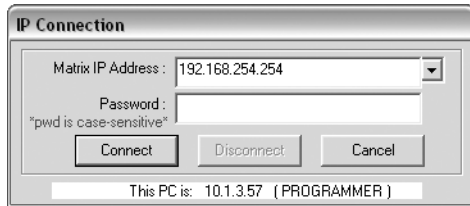
NOTE For a comm port, check the baud rate displayed in the comm port selection window. If you need to change the baud rate, click the **Baud** button and double-click the desired baud rate.

9600 baud
19200 baud
38400 baud
115200 baud

Click **OK**.

If you selected a serial port in step 2, the Matrix Switchers Control Program is ready for operation.

3. If you selected IP [LAN] in step 2, the IP Connection window appears.



- a. Examine the Matrix IP Address field, which displays the last Matrix IP address entered.

If necessary, enter the correct IP address in the field.

NOTE 192.168.254.254 is the factory-specified default value for this field.

- b. If the switcher is password protected, enter the appropriate administrator or user password in the Password field.
- c. Click **Connect**. The Matrix Switchers Control Program is ready for operation.

Accessing the HTML Pages

Another way to operate the switcher is via its factory-installed HTML pages, which are always available and cannot be erased or overwritten. The switcher's HTML pages are accessible through its LAN port, connected via a LAN or WAN, using a web browser such as Microsoft Internet Explorer. See ⑧ on page 2-5, for connection information.

Configuring for Network Communication

The first time you connect a PC to a switcher BME via its LAN port, you may need to temporarily change the PC's IP settings in order to communicate with the controller. Then you must change the controller's default settings (IP address, subnet mask, and [optional] administrator name and password) in order to use the unit on an intranet (LAN) or on the Internet. After you have set up the CrossPoint or MAV switcher BME for network communication, you can reset the PC to its original network configuration.

NOTE The computer and the switcher BME must both be connected to the same subnet on a LAN (using a straight-through cable). Alternatively, you can use a crossover Ethernet cable to connect the controller directly to the computer.

Use the ARP command to configure the IP address as follows:

1. Obtain a valid IP address for the CrossPoint or MAV switcher BME from the network administrator.
2. Obtain the switcher BME's MAC address (UID #) from the label on its rear panel. The MAC address should have this format: 00-05-A6-xx-xx-xx.
3. If the switcher BME has never been configured and is still set for factory defaults, go to step 4. If not, perform a Mode 4 system reset. For detailed information on reset modes, see "Rear Panel Operations" in the CrossPoint 450 Plus / MAV Plus Switcher User's Manual.

NOTE The switcher BME must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.

4. At the PC, access the MS-DOS command prompt, then enter the `arp -s` command. Type in the desired new IP address for the unit (obtained in step 1) and the unit's MAC address (from the unit's rear panel). For example: `arp -s 10.13.197.7 00-05-A6-03-69-B0` and then press [Enter].

After receiving the `arp -s` command, the controller changes to the new address and starts responding to the ping requests, as described in step 5.

NOTE You must ping the CrossPoint or MAV switcher BME as shown in step 5 for the IP address change to take place. The response should show the new IP address, as shown in the following figure.

5. Execute a ping command by entering “ping” followed by a space and the new IP address at the command prompt. For example:
`ping 10.13.197.7`

```
C:\>ping 10.13.197.7
```

```
Pinging 10.13.197.7 with 32 bytes of data:
```

```
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
```

```
Ping statistics for 10.13.197.7:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

NOTE You can reconnect using either Telnet or a Web browser to verify that the update was successful.

6. After verifying that the IP address change was successful, enter and issue the “`arp -d`” command at the DOS prompt. For example:
`arp -d 10.13.197.7` removes 10.13.197.7 from the ARP table
or
`arp -d*` removes all static IP addresses from the ARP table.

Loading the start-up page

NOTE If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft Internet Explorer, click **Tools > Internet Options > Connections > LAN Settings**, uncheck the **Use a proxy server...** box, and then click **OK**.

NOTE For details on operating the switcher via HTML pages, refer to the CrossPoint 450 Plus / MAV Plus Switcher Manual, chapter 6, “HTML Operation”.

1. Start the Web browser program.
2. Click in the browser’s Address field.
3. Enter the Matrix IP address in the browser’s Address field.

NOTE 192.168.254.254 is the factory-specified default value for this field.

4. Press the keyboard Enter key. The switcher checks to see if it is password protected.

If the switcher is not password protected, it checks and downloads the HTML start-up page. The switcher is ready for operation via HTML remote control.

If the switcher is password protected, the switcher downloads the Enter Network Password page.



NOTE A User name entry is not required.

5. Enter the appropriate administrator or user password in the **Password** field and click **OK**.
6. The switcher downloads the HTML start-up page. The switcher is ready for operation via HTML remote control.

